



特別企畫
Special Report

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守護自然 不留痕跡

LNT世界正流行

Leave No Trace

A Global Trend in Outdoor Ethics



寶島台灣，擁有許多世界級的景觀，不過在親近大自然的同時，還要懂得學會珍惜資源、保育環境，才能讓生態瑰寶永續留存。近來，台灣開始出現有善對待環境的作法，發起負責任的旅遊活動，而這種稱之為“Leave No Trace”的概念現正盛行於全世界。

Formosa, the land of spectacular beauty. Yet it should do more than admire her many charms; resources must be protected, and the environment conserved, to ensure a sustainable future. Lately Taiwan has begun to promote the concepts of outdoor ethics, and to advocate responsibility ecotourism. The educational program Leave No Trace is now spreading throughout the world.

造訪玉山北峰至主峰的雄偉景觀。(玉管處提供 吳玉麟攝)
The trail from Mt. Jade North Peak to Mt. Jade Main Peak. (by Yu-lin Wu, provided by YSNP)



行政院在民國91年將「國家步道系統建置發展計畫」納入「國家重點發展計畫」中，具體內容包括步道設置管理規範訂定、資源調查、系統規劃、宣導推廣等，其中一項經營管理的重要方向，就是發展多樣且低環境衝擊之生態旅遊，在參考多數先進國家自然保護的歷程後，決定師法美國的“Leave No Trace”運動，推行低衝擊的生態使用行為。

在台灣被命名為「無痕山林」的Leave No Trace(簡稱LNT)，是向大眾宣導一種「走過不留痕跡」的理念，希望山林的使用者具備一定的道德良知與行為準則，在野外進行活動時，能以環境保護為出發點，讓自然環境的破壞與衝擊降到最低。

無痕運動的起源

LNT並非是一種全新的理念，發源地美國早在80年代就已開始推行。在1960年起，當時美國因國民所得增加、休閒觀念改變等情況下，戶外遊憩活動漸趨盛行，娛樂時數成為快樂的表徵，更代表先進國家主體的發展。但反之，因各地區的遊客量大幅增加，不論是公有或私人的土地用量，因過度頻繁使用，使得自然和文化資源受到嚴重衝擊。

當時美國境內的土地管理者，面臨經營的窘境，除要提供良好的遊憩品質之外，還必須克服如何降低環境被破壞的棘手問題，尤其是要糾正多數人對保育所抱持的無知心態。根據研究調查顯示，一般大眾對踐踏草地、走捷徑、另闢營區等行為並不以為意，殊不知在長期累積下，看似輕微的損傷，對大自然來說，卻是難以復原的災害。

The Executive Yuan started establishing the National Trail System to subsume “National Development Plan” in 2002, laying down groundwork for regulations, management systems, promoting awareness, and conducting forest inventory etc. One of the major objectives of the system was to develop minimizing the degrading impacts of ecotourism. After reviewing the Nature protection policies of various countries, the authority decided to adopt the Leave No Trace program advocated by the United States of America.

Leave No Trace (LNT) is aimed at educating those who enjoy outdoor activities about their impacts on the environment, and ways to minimize these impacts.

The Origin of Leave No Trace

LNT is not a brand new concept. Originating from USA, it was initiated in the 1980s. Outdoor recreation had increased dramatically in the 1960s, following a growth in Per Capita Income and changes in recreational trends. However, the expansion of natural area visitation has brought about serious impacts on the land, both private and public.

Land managers faced with the dual challenge of providing high quality outdoor experiences and minimizing the degrading impacts brought on by the visitors. The problem was further aggravated by the fact that most people had little or no knowledge regarding their impacts. Research demonstrated that most natural area visitors made no qualms about trampling on natural vegetation, taking shortcuts or creating new campsites. Little did they realize that accumulated damages, however slight, could prove to be irreversible over the long term.



左圖 Left: 雷尼爾山國家公園設置有禁止踐踏草地的標誌。(郭育任 提供)
Mount Rainier National Park put up signs to advise visitors not to trample on grass. (by Yu-ren Guo)

右真圖 Right: 設置遊客步道，是在開放遊憩與保護概念之間求取平衡的方式。(郭育任 提供)
Establishing visitor trails in national parks ensure a balance between recreation and conservation. (by Yu-ren Guo)





從1970年起，美國人開始倡導降低環境遊憩使用，並宣揚自然保育的口號。伴隨著環境惡化日益嚴重，相關單位試圖以訂定法令來強制規範遊客行為。可惜的是，硬性法規經常引起遊客的反感，保護行為因而未能達到預期成效。於是美國林業署、土地管理局與國家公園署等主要政府單位，決定回歸人性基層面，開始教育大眾以低衝擊性的遊憩行為，出自內心、自動自發的保護資源。爾後，產官學界亦發行《荒野倫理》、《無痕露營》等宣導教育手冊，這就是美國推展無痕運動的緣由。

In the 1970s, the concepts of low impact recreation and conservation were developed. As degradation of the natural lands worsened, land management initially applied regulations to address visitor impact problems. However, regulatory efforts more often antagonized visitors than not, and were thus not effective. The U.S. Forest Service, Bureau of Land Management, and the National Park Service developed educational programs to supplement the regulations. During that time, a number of pamphlets were written about outdoor ethics and minimum impact camping, including "Wilderness Ethics" and "No-Trace Camping".

無痕運動的發展

The Development of Leave No Trace

1970年代中期，美國林業署荒野管理部門依無痕運動的觀念，發展出一套教育系統，於主要遊憩區的入口處，加強個人宣導服務，並主動鎖定特定遊客族群，灌輸無痕旅遊的概念和技巧；1980年代初期，再導入戶外道德教育的課程，直至1987年時，三大主要政府單位還合作發行《無痕的土地倫理》，宣導遊客對荒野土地應有的保育行為與尊重。

During the mid-1970s, the U.S. Forest Service developed an educational program aimed at major wilderness accesses. Visitors were advised of low impact concepts and techniques by individual counselors. In the early 1980s, the outdoor ethics program was introduced. By 1987, the three major governmental agencies collaborated to publish "Leave No Trace Land Ethics" to educate the public about low impact behavior in the wilderness.

美國林業署並於1990年與一非營利學校團體「國家戶外領導學校」(National Outdoor Leadership School, 簡稱NOLS)合作，訓練管理人員教導旅客減少對環境的衝擊行為，以實際訓練與行動取代宣導口號；1991年，林業署正式和NOLS策略結盟，整合理念、擬定LNT的環境教育學習課程。

In 1990, the U.S. Forest Service partnered with the non-profit National Outdoor Leadership School (NOLS) to train management personnel in the education of low impact behavior for visitors. In 1991, the U.S. Forest Service entered into a formalized partnership with NOLS to develop LNT environmental education course.



上圖 Above :
NOLS西北分校的人工岩場，可訓練模擬郊外運動。(郭育任 提供)
The rock climbing facility in NOLS provides training in outdoor recreational activities. (by Yu-ren Guo)

下圖 Below :
NOLS可提供受訓者對登山與露營等裝備的需求。(郭育任 提供)
NOLS provides training in mountain climbing and camping techniques. (by Yu-ren Guo)

兩單位的成功結盟，引來更多團體加入，除政府的公部門之外，NOLS還尋求「美國戶外遊憩聯盟」、「運動貨品生產協會」等單位的合作，建立完整的運作機制，並註冊成立「不留下痕跡公司」的非營利法人教育機構，後更名為「推廣戶外倫理的無痕中心」，負責全美的LNT推動計畫。

The successful collaboration between U.S. Forest Service and NOLS set the foundation for further partnerships with the Outdoor Recreation Coalition of America (ORCA) and the Sporting Goods Manufacturers Association (SGMA). Leave No Trace, Inc. was registered as a non-profit entity. Later it became the "Leave No Trace Center for Outdoor Ethics" to promote the program on a national level.



進入美國雷尼爾山國家公園前，嚮導會再三告知簡裝、輕食等保育概念。（郭育任 提供）

Before you step foot into Mount Rainier National Park, the guide will remind you of conservation principles, including advice to travel light and pack simple food. (by Yu-ren Guo)



無痕運動的準則

美國的LNT訓練課程多強調荒野地區的準則，除重視基本教育訓練外，也發行手冊、影片、海報、網站等宣導品詳載LNT的觀念與技巧，並明文條列化LNT的7大準則（請查閱P.50-58）。此外，亦針對不同區域環境與特殊活動，製作專屬的LNT技能手冊，像是北美地區的核心總論篇、阿拉斯加寒原地區、沙漠及峽谷地區、湖區、熱帶雨林等10個重要旅遊區域環境，以及進行洞穴探索、攀岩等6種特殊活動，所需注意的無痕準則。

為讓民眾能徹底落實LNT運動，其教育訓練、研究與推廣成為LNT計畫中最主要的工作。在NOLS就設有LNT專業課程，是所有相關環境訓練中最負盛名的經典課程，為期5至6天的野外密集訓練，教導學員LNT技巧、倫理與戶外教學的方法，完成訓練者可獲頒證書，成為種子教師。而精簡版課程主要受訓對象為青年團體領導人、戶外探險活動的員工等，訓練學員將來可帶領教導團體組織；另外，也有受訓時間更短的Workshops，如半天的童軍訓練等；扮演非正式LNT資訊提供的Public Contacts，如在遊客中心鄰近步道的起始點提供相關資訊等。

The Principles of Leave No Trace

LNT provides basic training courses that emphasize on outdoor ethics and low impact techniques. Its outreach materials include booklets, videos, and posters, as well as a website to provide detailed information about LNT concepts and skills. LNT is based on 7 principles (page 50-58). Educational booklets cover 10 specific environment ranging from the Alaskan tundra, deserts, canyons, lakes to the tropical rainforests. Booklets for recreational activities such as caving and rock climbing are also available.

LNT aims to promote and inspire responsible outdoor recreation through education, research and partnerships. The five to six-day Leave No Trace Master Educator Course is a classic training program that instructs participants on the techniques, ethics and outdoor education aspects of low impact recreation. Successful graduates of the course become certified Leave No Trace trainers. The two-day Trainer Course provides training for youth leaders and outdoor activities organization staff, who will be able to educate other groups on the concepts and skills of LNT. There are also Awareness Workshops that are one-day or less in length, for example a half-day Boy Scouts workshop. Public Contacts in visitor centers provide information of LNT as well.

左頁圖 Left:

國家公園設有解說牌，用圖文並茂的方式詳述當地生態環境。（郭育任 提供）

Interpretation signs are placed around the park, introducing visitors to the local natural environment. (by Yu-ren Guo)

右頁圖 Right:

位於西雅圖的卡奇克公園內，有提供可分解式垃圾袋，供民眾溜狗時處理排遺使用。（郭育任 提供）

Carkeek Park in Seattle, provide "degradable pick-up mitt" for people deal with pet waste. (by Yu-ren Guo)



成功經驗分享

在概念、原則與訓練計畫擬定後，國家系統的管理單位就必須針對地區特性設置相關設施，以有效達到開放觀光遊憩與環境保護之平衡。文化大學景觀學系講師郭育任，是「台灣國家步道環境優化推動發展計畫」的主持人，負責研擬台灣無痕山林的推動工作。他表示，各國發展LNT運動時，多半會依該保護區生態特性，訂定適合的環境規範守則，並設置公共服務設施以提供當地即時的环境資訊，讓遊客在尚未進入園區內，就已有初步的了解。

在導入公共服務設施的同時，還必須顧及與環境和諧共處的模式，像是車道表面材質的特性選擇、廁所坐落的位置與造型等。另外，設置解說標誌亦是倡導LNT、推廣生態旅遊的重要設施，具有提醒旅客、宣導正確認知與相關限制等功能；解說內容最好還能依地質景觀、動植物生態、人文史蹟等，以生動有趣的方式吸引旅客的注意，成功說明生態資源的價值，改變遊客的長期信念與態度。

The Success Model

To strike a balance between providing recreation opportunities and protecting the natural lands, the national management agency should establish relevant support in specific regions after developing the concepts, principles and training programs. Yu-ren Guo, a lecturer at the Department of Landscape Architecture of Chinese Culture University, heads the Taiwan National Trail Enhancement Program which also promotes LNT in the island. He notices that LNT programs are usually supplemented by relevant regulations in many countries. Managing agencies establish public facilities to provide information to visitors before they enter the area.

The public establishments must be in line with the principles they promote. Car park grounds and washroom locations etc should be put into consideration. Interpretation signs are also important portals of LNT promotion through which visitors learn about appropriate behavior and relevant regulations. Interpretation sign contents should focus on the geographical, flora and fauna, and cultural heritage features of the place. The presentations of the information should be interesting enough to capture visitor attention so as to successfully relate the value of ecological resources and influence visitors' attitude.



郭育任 Yu-ren Guo

美國俄亥俄州立大學自然資源管理碩士，現任中國文化大學景觀系專任講師、中華民國國家公園學會活動委員會主任委員、中華民國永續發展學會理事。

M.S., Ohio State University, currently teaching at the Department of Landscape Design of Chinese Culture University. He is also the executive director of the activity division of National Park Association in Taiwan, and a board member of Sustainability Development Association.



無痕運動盛行全世界

LNT概念的宣揚，除各國主要管理單位外，其他聯盟機構也都盡全力協助傳遞。郭育任舉了美國幾個相關單位為例，如著名的Subaru汽車製造商，為擔心四輪傳動越野車可能對環境造成的破壞，於是製作印有「成人版」與「兒童版」的LNT準則貼紙，讓民眾在駕駛車輛時，能將準則貼附在前窗玻璃上，時時提醒各年齡階層的人重視無痕運動。

另外，像是美國最大的戶外遊憩用品公司REI，於位在西雅圖的3層樓店面裡，與美國國家公園署、林業署、土地管理局、漁類與野生動物保護署等合作，設置環境資源及LNT的「諮詢櫃台」，讓喜愛走進大自然的民眾能在購買戶外活動用品時，就能潛移默化地習得LNT的觀念，汲取正確知識，養成習慣。

Leave No Trace Around the World

Other than governmental management agencies, other organizations strive to advance the concepts and practice of Leave No Trace as well. Car manufacturer Subaru, concerned with the impact that four-wheel drives are causing the environment, prints Leave No Trace Principles stickers (both adults and children versions) to remind drivers of responsible outdoor recreation.

REI, the largest outdoor gear company in USA, has a Leave No Trace Information Counter in its Seattle three-storey store to provide essential LNT information for people who enjoy outdoor recreation. The counter, the result of a collaboration between various agencies including the U.S. Forest Service, Bureau of Land Management and the National Park Service, aims at educating the public of LNT concepts and applications.



REI在店內設有LNT的諮詢櫃台。
(郭育任 提供)
REI has an LNT information counter in its store. (by Yu-ren Guo)



攀爬東南亞第一高峰神山，必須遵守管理局訂定的嚴苛登山準則。
(郭育任 提供)

Mount Kinabalu is the highest peak in Southeast Asia, one has to abide by the strict regulations of the management. (by Yu-ren Guo)

近來，LNT已成為一種國際化的運動，像是英國、加拿大等地也因與美國NOLS分支合作，所以其國家步道系統也大都採行美國制定的LNT準則。以遊歷澳洲大堡礁國家公園為例，就是以生態旅遊的方式融入LNT的概念，在搭乘往大堡礁的遊艇船上，就會播放生態維護須知，要求浮潛時不得碰觸珊瑚礁、不可餵食魚蝦、不能使用洗髮精及沐浴乳等清潔用品，即在尚未登島前就開始告知生態保育的要點。登島後，隨處可見以各種語言組成的解說告示牌，時時提醒遊客遵守相關法則；在旅遊過程中，當地解說員還會不斷灌輸生態保育的觀念，讓人不由得更加謹慎、自我約束行為。

另外，到歐洲、印度、尼泊爾、巴基斯坦等國家登山，為了保護山林資源，也都各有其嚴格的管理制度。郭育任以東南亞第一高峰的神山為例，想挑戰海拔4,095公尺的神山，除了事前須經申請，由管理處將每8名登山客配屬1名當地嚮導帶領外，每位登山客還需配戴印有編號、姓名等資料的吊牌，以落實生態及遊客安全上的管理措施。郭育任表示，吊牌是為了方便嚮導辨識，並在經過重要關卡時，可由駐地人員登記控管往返人數，以妥善管理承載遊憩量及生態資源保育。

Recently, Leave No Trace has become a global trend. Land management agencies in countries like England and Canada are adopting LNT programs. If you visit the Great Barrier Reef in Australia, you will be advised about LNT techniques while you are on the cruise boat enroute to the reef. You will be reminded not to touch the coral reefs while you dive, not to feed the fish, not to use shampoo and bath products etc. At your destination, ubiquitous signs in different languages serve as constant reminders of appropriate behavior. Local interpreters do their part in transmitting concepts of conservation as well.

Mountain climbing activities in European countries, India, Nepal and Pakistan etc. are also strictly regulated to minimize impacts. Yu-ren Guo cites Mount Kinabalu, the highest peak in Southeast Asia, as in example. To climb the 4,095 meters mountain, mountain climbers must acquire a permit prior to their attempts. A local guide is allocated to every 8 persons, and every single climber has to wear a tag that lists the name and register number. The tag helps the guide to identify his wards, and also keeps a tab on the number of visitors going through to ensure maximum capacity levels are observed.



台灣無痕運動的開端

郭育任強調，雖然有些國家尚未進步成已開發國家，但卻不減對山區環境資源的愛護，同樣會訂定高標準的管理制度，以達開放觀光與生態保育的雙贏局面。本身就非常愛山親山的郭育任認為，台灣擁有不同海拔的生態環境，從奇峻連峰、碧綠湖泊、湛藍大海、冰河遺跡到高山草原，豐富的林相與多樣性生物，堪稱一座最難能可貴的自然教室。如何將LNT運動的概念落實到國小、國中的正統教育，讓民眾在成長過程中，就能養成與自然相處的正確之道，是目前推展LNT運動的重要課題。

Leave No Trace in Taiwan

Yu-ren Guo emphasizes that fact that developing countries are not far behind in their pursuit for natural resource conservation. Stringent regulations are applied to ensure a win-win situation in the struggle between tourism growth and environment protection. A mountain lover, Guo thinks that Taiwan is an invaluable outdoor classroom that features myriad ecological environment, ranging from steep mountains, lakes, oceans, glacier relics to alpine tundra. The main objective of LNT in Taiwan is to integrate the principles and practice into elementary and junior high curricula, ensuring that our younger generations are brought up with proper attitude towards the natural environment.



上圖 Above:

冷杉是台灣分布最高的針葉樹林，再往上行會逐漸由玉山圓柏以及玉山杜鵑形成的群落取代，這些常綠的灌叢植物就稱為高山矮盤灌叢。（廖東坤 攝）

kawakamii are coniferous trees distributed at the highest elevation in Taiwan. They upward growth is replaced by communities of *Juniperus squamata* and *Yushan rhododendrens*. These evergreen tree are known as krummholz.(by Dong-kun Liao)

下圖 Below:

玉山海拔3,952公尺，主峰直落至300公尺的拉庫拉庫溪底，蘊育著豐富林相，圖為玉山圓柏。（楊志雄 攝）

Yushan stands at 3,952 meters. Its main peak drops off 300 meters to the Lakulaku River, and harbors a myriad of life forms. This photo is *Juniperus squamata*. (by Mike Yang)





其實LNT運動的概念與台灣國家公園行之有年的「生態旅遊」有不謀而合之處。推動生態旅遊需整合基於自然、環境教育與解說、永續發展、喚起環境意識、利益回饋等5個面向，才能顯現生態旅遊的精神，其與LNT有著相同的保育目標，只是實施細項的差別而已。

因此，台灣推動LNT運動的同時，亦可以考量發行登山護照，讓每位小朋友在國中小學畢業前，都要依循LNT原則，攀爬縣市鄰近的一座山岳，並藉由登山準則的規劃，了解不留下任何垃圾、執行攜帶密封袋分配好的食物上山、到離水源一定範圍外紮營生火等實務性原則，試著從最基礎的教育訓練著手，開啟台灣無痕運動的新體驗。

Leave No Trace program matches in principle and practice the ecotourism program that the National Parks of Taiwan has been advocating for years. The ecotourism program covers five areas: environmental education, interpretation, sustainable development, environmental awareness, and responsible operation. The objectives of the program are in line with that of LNT, differing only on the details of practices.

Taiwan's LNT program can start with the issuance of a mountain climbing passport to elementary and junior high school students. This will mean that every young person in the country will have firsthand experience of climbing a local mountain and learning the skills of LNT. They will be trained to pack out their trash, bring properly packaged food, select appropriate campsites away from water sources, and proper campfire usage. Hopefully this basic training will educate our younger generation on the principles of low impact recreation.



旅行者準則

「許自己一個親炙健康土地的現在與未來」，是台灣推動「全國步道環境優化宣言」的內容標題，為的就是宣導每個人都要有關懷土地倫理與履行生態保育的觀念，也要能用行動珍惜美好環境，讓所有人都能一起傳承台灣的豐饒土地，做個負責任的旅人。

「輕裝、簡食、徐行、寧靜」，是郭育任提出山林旅行者應遵守的準則，一位好的旅行者，應該能懂得自我反省，不要認為背大量的食物上山，吃大魚大肉會是一種享受，要懂得以簡單的食物果腹，抱著回歸自然的心態遊歷山林。

也最好盡量減少自身裝備，以避免造成負荷，留下重跡 破壞自然；更不要比快 趕速度，只想創造速度與攻山頭 登百岳的紀錄，因為搶速度、走捷徑，只會影響身體健康且損害步道山徑；再者，要體會如何在獨處的環境下，還能靜謐沉澱，聆聽心裡最深層的聲音，藉以洗滌心靈。

A Traveller's Guide

The National Trail Enhancement Program in Taiwan strives to "Create Positive Outdoor Recreational Experiences for the Present and Future." Its mission is to instill and inspire low impact outdoor ethics and conservation awareness, so that visitors to natural area resources will be responsible in their outdoor recreation.

"Travel light with simple food, proceed slowly and quietly," advocates Yu-ren Guo. A responsible visitor should understand that bringing loads of food to have a feast up on the mountains is not an appropriate enjoyment. Sustaining on simple foods and feasting your eyes on the natural beauty is what that counts.

It is also advisable to travel with minimum gear to minimize impact on the land. Avoid competing with fellow visitors to reach your destination. Focusing on getting ahead and taking shortcuts will only bring adverse effects to your health and cause damage to the trails. Enjoy your travel in quiet and solitude, and be refreshed by nature.



左圖 Left:
將垃圾帶下山，是每位造訪山林者必須遵守的保育原則。(王培麟攝)
The hikers are encouraged to pack out their own trash to observe the principle of conservation. (by Peter Wang)

右圖 Right:
行進於山林野境間，請採行低環境衝擊之宿營與休閒活動方式，讓台灣山林未來能永續留存。(王培麟攝)
To ensure sustainability for nature, please adopt low impact practices during camping and recreation activities. (by Peter Wang)